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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/774,685	02/01/2001	Yutaka Yamanaka	1538.1009/JDH	3647

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EXAMINER	
TANG, KUO LIANG J	
ART UNIT	**PAPER NUMBER**
2122	

DATE MAILED: 03/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/774,685	YAMANAKA ET AL.	
	Examiner	Art Unit	
	Kuo-Liang J Tang	2122	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 November 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is in response to the amendment filed on 11/01/2004.

The priority date for this application is 10/05/2000.

Response to Arguments

2. Applicant's arguments, see page 6, lines 27-28, filed 11/01/2004, with respect to the rejection of claims 1, 7, 13 under USC § 103(a) have been fully considered and are persuasive. The rejection of claim 1 has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made.

Claims 1, 7 and 13 have been amended.

Claims 1-18 are pending and have been examined.

Claims 1- 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over OpenMP Architecture Review board, "OpenMP Fortran Application Program Interface", Version 1.1-november-1999 (hereinafter OpenMP), in view of Iwasawa et al. US Patent No. 5,151,99 (hereinafter Iwasawa), further in view of Callahan, II et al., US 6,665,688 (art of record, hereinafter Callahan).

In the remarks, the applicant argues that:

As for independent claim 1, the Applicants primarily argue that,

a. OpenMP fails to teach or suggest "detecting a parallelization directive described by a user in said source program" (see Response page6 lines 10-12).

b. Iwasawa fails to teach or suggest "a hierarchical structure in accordance with an internal structure of said parallelization directive" (see Response page 6, line 30 to page 7 line 1).

c. Iwasawa fails to teach or suggest "if said parallelization directive is detected, generating a front-end intermediate language" (see Response page 6, lines 12-13).

Examiner's response:

a. The examiner disagrees with Applicants assertion that OpenMP fails to teach or suggest "detecting a parallelization directive described by a user in said source program". In fact, OpenMP discloses "detecting a parallelization directive described by a user in said source program" (E.g., see page 9, Figure and associated text, e.g., in particular see page 9, last paragraph, which states "When a thread encounters a parallel region, ..."). Also, it is obvious to see that the parallelization directive is defined (described) by a user, not by the computer.

b. The examiner disagrees with Applicants assertion that Iwasawa fails to teach or suggest "a hierachical structure in accordance with an internal structure of said parallelization directive". In fact, Iwasawa does not disclose hierarchical structure for parallelization directive. OpenMP discloses "parallel region is a hierarchical structure" (E.g., see page 9, Figure and associated text, e.g., in particular see page 9 & 48., which states "!$OMP PARALLEL, [clause[[,] clause] ...]", where "PARELLEL and clause" is in a "Directive and Clauses" hierarchical structure).

c. The examiner agrees with Applicants assertion that Iwasawa fails to teach or suggest "generating a front-end intermediate language". However, Callahan (art of the record) cures the deficiency (see col. 31 to col. 9:43)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1- 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over OpenMP Architecture Review board, "OpenMP Fortran Application Program Interface", Version 1.1-november-1999 (hereinafter OpenMP), in view of Iwasawa et al. US Patent No. 5,151,99 (hereinafter Iwasawa), further in view of Callahan, II et al., US 6,665,688 (art of record, hereinafter Callahan).

As Per Claim 1, OpenMP discloses the method that covering the steps of:

"detecting a parallelization directive in said source program;;" (E.g., see page 9, Figure and associated text, e.g., in particular see page 9, last paragraph, which states "When a thread encounters a parallel region, ...").

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!$OMP PARALLEL [clause[[,] clause]...]

block

!$OMP END PARALLEL
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OpenMP teaches a well known FORTRAN structure for Parallel region construct contains such list structure(E.g. PROVATE(list), SHARE(list) of pg. 9). OpenMP doesn't explicitly disclose if said parallelization directive is detected, generating an intermediate language. However, Iwasawa teaches directive (E.g. see Col. 1:22-23) and "the parallel execution of each iteration of the loop is detected using FORTRAN language" (E.g. see col. 2:19-29); if said parallelization directive is detected, generating an intermediate language (E.g., see FIG. 1, 3, intermediate language) for said parallelization directive by positioning on a storage region, each processing code of at least part of the parallelization directive with a hierarchical structure(E.g., see FIG. 5) in accordance with an internal structure of said parallelization directive." (E.g., see FIG. 13, PROCESSOR 1 to PROCESSOR NPE). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made incorporate the teaching of Iwasawa into the system of OpenMP, to generate an intermediate language. The modification would have been obvious because one of ordinary skill in the art would have been motivated use a well known data structure (list) particularly for the same programming language, FORTRAN, to take the advantages of the well known defined structure for the parallelization compile method and system.

The combination of OpenMP and Iwasawa doesn't explicitly disclose a front-end intermediate language. However, Callahan teaches a front-end intermediate language (E.g. see col. 31 to col. 9:43). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made incorporate the teaching of Callahan into the system of

OpenMP and Iwasawa, to generate a front-end intermediate language. The modification would have been obvious because one of ordinary skill in the art would have been motivated so that development environment provides services for generating front-end intermediate language code from source code in different programming languages and for generating object code from the front-end intermediate language code .

As Per Claim 2, the rejection of claim 1 is incorporated and further the combination of OpenMP, Iwasawa and Callahan teaches:

"a step of adding to said front-end intermediate language of a statement to which the parallelization directive is applied, reference information from said front-end intermediate language of said statement to which the parallelization directive is applied, to said front-end intermediate language for the parallelization directive." (E.g., see Iwasawa, FIG. 5 & 6 and col. 6:11-27).

As Per Claim 3, the rejection of claim 1 is incorporated and further the combination of OpenMP, Iwasawa and Callahan teaches:

"a step of, by using a processing table which stores one or a plurality of items of processing information for each of said processing codes, acquiring the processing information corresponding to a current processing content based on said processing code within the front-end intermediate language for said parallelization directive." (E.g., see Iwasawa, FIG. 5 & 6 and col. 6:11-27, loop table).

As Per Claim 4, the rejection of claim 3 is incorporated and further the combination of OpenMP, Iwasawa and Callahan teaches:

"current processing content is one of type analysis, syntactic analysis, semantic analysis, and generation of a compiler intermediate language." (E.g., see Iwasawa, FIG. 3, blk 13 (PARSING) & 6 (INTERMEDIATE LANGUAGE) and col. 5:55-67 to 6:1-10).

As Per Claim 5, the rejection of claim 1 is incorporated and OpenMP teaches "said hierarchical structure is a list structure." (E.g., see pg. 9-11, Section 2.2 Parallel region construct).

As Per Claim 6, the rejection of claim 1 is incorporated and OpenMP teaches "a directive, a clause, and a line, and a processing code for said directive is linked downward to a processing code for said clause, and said processing code for said clause is linked downward to a processing code for said lines." (E.g., see pg. 11-14, Section 2.3.1; pg. 17-18, Section 2.4.1 and pg. 25-29, Section 2.6.2).

As Per Claim 7, this is a method version of the claimed storage medium of Claim 1. Thus, the rejection as set forth in Claim 1 also applied.

As per Claims 8-10, recite such claimed limitations which also have been addressed in Claims 2-4, respectively.

As per Claims 11-12, recite such claimed limitations which also have been addressed in Claims 5-6, respectively.

As Per Claim 13, this is an apparatus version of the claimed storage medium of Claim 1. Thus, the rejection as set forth in Claim 1 also applied.

As per Claims 14-16, recite such claimed limitations which also have been addressed in Claims 2-4, respectively.

As per Claims 17-18 recite such claimed limitations which also have been addressed in Claims 5-6, respectively.

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kuo-Liang J Tang whose telephone number is (571) 272-3705. The examiner can normally be reached on 8:30AM - 7:00PM (Monday – Thursday).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Dam can be reached on (571) 272-3695. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kuo-Liang J. Tang

Software Engineer Patent Examiner

TUAN DAM
SUPERVISORY PATENT EXAMINER